UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/476,615	12/31/1999	MICHAEL S. CRONE	GE-W-192-CIP	8072

7590 05/25/2005

Duane Morris LLP
1667 K Street N.W.
Suite 700
Washington, DC 20006

EXAMINER	
BOYCE, ANDRE D	

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/476,615	CRONE, MICHAEL S.	
	Examiner	Art Unit	
	Andre Boyce	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-7 and 13-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-7 and 13-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 4, 2005 has been entered.

2. Claims 2, 6, and 13 have been amended. Claims 8-12 and 17-19 have been canceled. Claims 2-7 and 13-16 are pending.

Claim Rejections - 35 USC § 101

3. Claims 2-7 and 13-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The basis of this rejection is set forth in a two-prong test of:

(1) whether the invention is within the technological arts; and

(2) whether the invention produces a useful, concrete, and tangible result.

For a claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena) that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful arts" (i.e., the physical

sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. For a process claim to pass muster, the recited process must somehow apply, involve, use, or advance the technological arts.

As to technological arts recited in the preamble, as seen in independent claims 2, 6, and 13, mere recitation in the preamble (i.e., intended or field of use) or mere implication of employing a machine or article of manufacture to perform some or all of the recited steps does not confer statutory subject matter to an otherwise abstract idea unless there is positive recitation in the claim as a whole to breathe life and meaning into the preamble. Here, a processor or computer based simulated annealing method in the preamble does not convey which steps, if any, the processor performs in the body of the claim. As such, without a positive recitation in the body of the claim, the use may simply be nominal. And the mere intended or nominal use of a component, albeit within the technological arts, does not confer statutory subject matter to an otherwise abstract idea if the component does not apply, involve, use, or advance the underlying process.

Additionally, for a claimed invention to be statutory, the claimed invention must produce a useful, concrete, and tangible result. In the present case the claimed invention selects the criteria for acceptance of a solution, etc., thereby producing a useful, concrete, and tangible result, but not within the technological arts as explained above.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 2-7 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matheson et al (USPN 5,623,413), in view of Fabre et al (USPN 6,405,186).

As per claim 2, Matheson et al disclose in a multiple move, simulated annealing method for resolving a scheduling problem associated with a plurality of orders for train resources, each order having a cost function and a scheduling window associated therewith (see column 19, lines 4-8), and (i) determining the total trip time associated with the plurality of orders (determined by the movement planner, based upon the trajectory of the train, see columns 13, lines 14-16 and 38-46); and (ii) determining the total slack time associated with the plurality of orders (see column 26, lines 16-19, where the total time is calculated from slack percentage). Matheson et al does not disclose the improvement comprising the steps of: (a) establishing plural criteria for acceptance of a solution; (b) classifying the scheduling problem; and (c) selecting the criteria for acceptance of a solution as a function of the classification of the scheduling problem and (iii) determining the classification of the problem as a function of the total trip time and the slack time. Fabre et al discloses simulated annealing, where constructing an initial plan in order to improve the quality of the simulated annealing is done by classifying the request (i.e., problem) with certain criterion, and selecting the opportunities in the order determined by the previously established classification (Applicant's step (c), see column 6, lines 10-20).

Fabre et al also discloses classifying requests in accordance with certain criterion (see column 6, lines 11-14). Further, Matheson et al discloses rule-based criteria that incorporate company policy, operating procedures, and experience factors, among others (see column 24, lines 4-6), wherein train operating procedures include total trip time and slack time, associated therein. Both Matheson and Fabre are concerned with optimizing a cost function via the simulated annealing technique, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include (a) establishing plural criteria for acceptance of a solution; (b) classifying the scheduling problem; and (c) selecting the criteria for acceptance of a solution as a function of the classification of the scheduling problem, and (iii) determining the classification of the problem in accordance with certain criterion in Matheson, as seen in Fabre, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

As per claims 3 and 7, Matheson et al does not explicitly disclose (a) selecting a predetermined percentage of total trip time to provide a threshold value; and (b) comparing slack time with the threshold value. Fabre et al discloses developing threshold parameters in accordance with the simulated annealing technique (see column 5, lines 46-55), while Matheson et al discloses rule-based criteria that incorporate company policy, operating procedures, and experience factors, among others (see column 24, lines 4-6), wherein train operating procedures include total

trip time and slack time, associated therein. Both Matheson and Fabre are concerned with optimizing a cost function via the simulated annealing technique, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include selecting a predetermined percentage of total trip time to provide a threshold value; and comparing slack time with the threshold value in Matheson, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

As per claims 4 and 5, Matheson et al does not explicitly disclose the selected percentage being less than about 100 percent and more than about 150 percent. Fabre et al disclose a selected percentage of 99 percent in order to determine the threshold condition value (column 4, lines 57-61). Further, any percentage between 0-100 percent is less than about 100 percent and there are infinite values more than about 150 percent. As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include selecting a percentage being less than about 100 percent and more than about 150 percent in Matheson et al thereby providing further means for classifying the scheduling problem, thus ensuring that the algorithm stabilizes after a certain number of iterations (Fabre, column 4, lines 63-64).

Claim 6 is rejected based upon the rejection of claim 2, as seen above, as containing the same limitations therein. Further, Matheson et al disclose (a) determining the total trip time associated with the plurality of orders (determined by

the movement planner, based upon the trajectory of the train, see columns 13, lines 14-16 and 38-46); and (b) determining the resource exception associated with the plurality of orders (see column 21, lines 10-12). Matheson et al do not explicitly discloses (c) determining the classification of the problem as a function of the total trip time and the resource exception. Fabre et al discloses classifying requests in accordance with certain criterion (see column 6, lines 11-14). Further, Matheson et al discloses rule-based criteria that incorporate company policy, operating procedures, and experience factors, among others (see column 24, lines 4-6), wherein train operating procedures include resource exception, total trip time and slack time, associated therein. Both Matheson and Fabre are concerned with optimizing a cost function via the simulated annealing technique, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include determining the classification of the problem in accordance with certain criterion in Matheson, as seen in Fabre, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

As per claims 13, 15, and 16, Matheson et al disclose a method for resolving a scheduling problem associated with a plurality of orders for train resources by evaluating available moves in a simulated annealing process, each move resulting in a change in the resource exception associated with the problem and a change in cost associated with the move (see column 19, lines 4-8), comprising the steps of:

(b) making a random move (see column 19, lines 14-15), (c) weighting the resource exception and cost factors associated with the random move (see column 21, lines 10-13); (d) evaluating the resource exception and the cost of the solution against a predetermined criteria (energy function); and g) accepting or rejecting the move based on the evaluation (see column 19, line 17-20). Matheson et al does not disclose (a) classifying the scheduling problem, a scaling parameter related to the classification of the problem, and the predetermined criteria is the classification of the problem. Fabre et al discloses classifying requests in accordance with certain criterion (see column 6, lines 11-14), and selecting the opportunities in the order determined by the classification (scaling parameter). Both Matheson and Fabre are concerned with optimizing a cost function via the simulated annealing technique, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include determining the classification of the problem in accordance with certain criterion in Matheson, as seen in Fabre, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

As per claim 14, Matheson et al does not disclose the steps of: (a) determining a normalizing component of the scaling parameter as a function of the change in resource exception and cost from previous moves; (b) determining a target resource exception as a function of the number of previous moves; and (c) determining a biasing component of the scaling parameter as a function of a comparison of the

resource exception of the current move to the target resource exception. Fabre et al discloses developing threshold parameters in accordance with the simulated annealing technique (see column 5, lines 46-55) and the threshold percentage ensuring that the algorithm stabilizes after a certain number of moves (column 4, lines 63-64). Further, Matheson et al does disclose moves to satisfy the constraints and to obtain a lowest cost solution (see column 19, lines 4-8). As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include determining a normalizing component of the scaling parameter as a function of the change in resource exception and cost from previous moves; (b) determining a target resource exception as a function of the number of previous moves; and (c) determining a biasing component of the scaling parameter as a function of a comparison of the resource exception of the current move to the target resource exception in Matheson et al, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

Response to Arguments

6. With respect to claims 2 and 6, Applicant argues that neither Matheson nor Fabre disclose a scheduling system classified according to the specific parameters as recited in the claims. With respect to claim 2, Applicant argues that neither Matheson et al nor Fabre et al disclose classification of the problem as a function of

total trip time and slack time. With respect to claim 6, Applicant argues that neither Matheson et al nor Fabre et al disclose classification of the problem as a function of total trip time and resource exception. The Examiner respectfully disagrees. With respect to both claims 2 and 6, Fabre et al disclose classifying requests in accordance with certain criterion (i.e., parameters) in order to construct an initial plan determined by the classification, with respect to optimizing a cost function via a simulated annealing technique (column 6, lines 11-23).

With respect to claim 2, Matheson et al discloses a slack time percentage parameter, which provides the planner with cushion with respect to movement of the train trips (column 26, lines 16-19). Further, Matheson et al disclose calculating the total time associated with the execution of each trip (i.e., total trip time) using the candidate resources (column 16, lines 1-4). As such, the combination of Matheson et al and Fabre et al indeed disclose classification via slack time and total trip time.

With respect to claim 6, Matheson et al disclose calculating the total time associated with the execution of each trip (i.e., total trip time) using the candidate resources (column 16, lines 1-4). Further, Matheson et al disclose the resource scheduler indicating that an exception has occurred and the identity of the resources and activities involved in the exception (i.e., resources exception, column 20, lines 52-56). Further, Matheson et al disclose an energy function in terms of resource exception, operating costs, and goals (column 21, lines 10-13). As such, the combination of Matheson et al and Fabre et al indeed disclose classification via slack time and total trip time.

Applicant goes on to argue that the Examiner may not rely on an optimization rejection unless the Examiner can show that the parameters being optimized have been recognized in the prior art as result effective parameters. First, the Examiner submits that this assertion, i.e., that the parameters being optimized must have been recognized in the prior art as results effective, seems to merely be Applicant's opinion, not based on any facts of record, nor the MPEP. Second, as discussed above Matheson et al, in view of Fabre et al indeed disclose the same parameters as seen in Applicant's invention. As such, assuming arguendo, that Applicant's parameters are result effective, then the combination of Matheson et al and Fabre et al would also be results effective, since Matheson et al disclose the same parameters.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre Boyce whose telephone number is (571) 272-6726. The examiner can normally be reached on 9:30-6pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

adb
May 20, 2005

TARIQ R. HAFIZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600